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ABSTRACT

As a response to the increasing mathematics and science teacher shortage, incentive programs have been developed and offered throughout the United States. Data pertaining to these programs were obtained from questionnaires completed by state officers from the District of Columbia and all of the 50 states except Hawaii. Survey results are organized and reported in eight separate areas. These findings reveal that: (1) 31 states currently offer incentive programs; (2) incentive loan programs are the most common type offered; (3) approximately 28 million dollars were spent for incentives for mathematics and science teachers between 1983 and 1986 (35% of the respondents did not report funding amounts); (4) approximately 7,000 people received funds under these programs (15% of the respondents did not provide this information); (5) eligibility required state residency and/or the need for certification or upgrading; (6) some states included subject areas other than science and mathematics in their incentive programs; (7) most states (92%) have plans to continue the programs in 1986-1987; and (8) three states completed evaluation studies on their programs. An appendix summarizes the type of program and percentage of funds for each state. (ML)

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A REVIEW OF INCENTIVE PROGRAMS FOR MATHEMATICS AND SCIENCE TEACHERS IN THE FIFTY STATES AND DISTRICT OF COLUMBIA 1983-1986

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A STUDY OF INCENTIVE PROGRAMS
FOR MATHEMATICS AND SCIENCE TEACHERS
IN THE FIFTY STATES AND DISTRICT OF COLUMBIA
1983-1985

This report views mathematics and science teacher incentive programs throughout the United States and the District of Columbia. These incentive programs are a response to the increasing mathematics and science teacher shortage (Howe & Gerlovich, 1981; Olstad & Beal, 1981, 1984; Taylor, 1984; Yoetist & Nickel, 1984; Custer, 1985; Rush, 1983, Bailey, 1983).

The following questions were addressed:

1. How many states offered incentive programs for mathematics and science teachers?

2. What types of incentive programs were used in the various states?

3. What amount of money was spent or allocated for these programs?

4. How many students received funds through these incentive programs?

5. What were the eligibility requirements for recipients of funds?

6. How many states included subject areas other than science and mathematics in their incentive programs? What proportion of the funds were allocated for science and mathematics?

7. What percentage of states projected the continuation of their incentive programs for the next two years?

8. How may states have completed evaluations of their incentive programs? What were the results of these evaluations?

Procedures

A questionnaire was prepared and mailed either to the chief state school officers or to the person who responded to last year's study (Beal, Olstad, and Harder, 1985). Questionnaires were sent to each of the 50 states and the District of Columbia. Follow-up surveys were mailed six weeks later, and follow-up telephone calls were made to states not responding by the requested date. The data from the questionnaires were summarized and any supporting documentation was reviewed. All states responded except Hawaii. This represents a 98 percent response rate.

Findings

Question 1: How many states offered incentive programs for mathematics and science teachers? (See Table 1.)

The number of states offering incentive programs has risen over the past three years. In 1983-84, 12 states reported using incentive programs; in 1984-85, 28 states used incentive programs; and in 1985-86, 31 states used incentive programs. The states currently using incentive programs are listed in Appendix A. Seven states reported that programs have been proposed, but not funded; Washington, D.C. dropped its program. The remaining 12 states had not considered using incentive programs. Due to incomplete responses to the survey by some states, we cannot report if the use of incentive programs reflects the states' estimated demand for mathematics and science teachers.

Table 1
Number of States Using Incentive Loan

Status	1983-84 Number	1983-84 %	1984-85 Number	1984-85 %	1985-86 Number	1985-86 %
Have program	12	24	28	55	31	61
Proposed not funded	na		8	15	7	14
Not considered	na		15	29	12	23
Dropped program	na		0	0	1	2

na = information not available

Question 2: What types of incentive programs are used in the various states? (See Table 2.)

The most common form of incentive is a loan program, which is used by 25 states. These loans contain a forgiveness clause that allows the student to have part of the loan forgiven for each year of teaching. For 19 states the loan program was the only type of incentive program available. Six states combined loans with other forms of incentives. Of the states using incentive programs in 1984-85, 48 percent of the states used loan programs exclusively; in 1985-86 this figure increased to 81 percent. The second most common form of incentive was scholarships. In 1985-86 nine states used scholarship incentives; five of these states used scholarships

in combination with other forms of incentives. The last type of incentive includes payment of tuition and stipends to recipients, which was used by five states. Four of these used stipends in combination with other incentives.

Table 2
Types of Incentives Used

Type of Incentive	Number of States 1984-85	1985-86
Loans only	13	19
Loans with other incentives	10	6
Scholarships only	2	4
Scholarships with other incentives	7	5
Tuition/stipends only	3	1
Tuition/stipends with other incentives	4	4

Question 3: What amount of money was spent or allocated for these programs? (See Table 3.)

The amount of money spent on incentive programs has continued to grow since 1983-84, when $2,925,000 was spent. For 1984-85 the study showed $8,744,000 spent, which is a 33 percent increase. For 1985-86, $16,671,500 was spent, which is a 190 percent increase since 1984-85 and a 570 percent increase since 1984-84.

Table 3
Funding for Incentive Programs

	1983-84	1984-85	1985-86
Number of states with incentive programs	12	28	31
Number of states reporting funding for programs	12	21	24
Total funding level	$2,925,000	$8,744,000	$16,671,500
Average funding level per state	$ 204,607	$ 416,380	$ 694,646

Question 4: How many students received funds through these incentive programs? (See Table 4.)

Twelve states reported funding for a total of 1,657 students in 1983-84. This is an average of 127 students per state. Twenty-one states reported funding 5,217 students in 1984-85, which is an average of 186 students per state. Even though there was approximately a 300 percent increase in the number of recipients, the average number of recipients per state only increased 150 percent. This reflects the fact that more states offered incentive programs.

Combining these data regarding the number of recipients with the preceding funding data, the average amount received by recipients has decreased about 5 percent. The data for the number of recipients in 1985-86 is not yet available.

Table 4
Incentive Funding Per Recipient

	1983-84	1984-85	1985-86
Number of states reporting	12	21	24
Total number of recipients	$1,657	$5,217	na
Average number of recipients	127	186	na
Average funding per recipient	$1,765	$1,676	na

na - information not available

Question 5: What were the eligibility requirements for recipients of funds? (See Table 5.)

Most of the states responding to this part of the questionnaire indicated that both students in teacher preparation course work and teachers certified in areas other than mathematics or science were eligible to apply for the incentive funding. Of the 31 states with incentive programs, 20 states supplied information regarding requirements for eligibility. Twelve states funded both teachers in preparation and currently certified teachers. Seven states funded only students preparing to teach. One state regarded only currently certificated personnel as eligible for incentives. All states required that the recipient be a resident of that state.

Table 5
Eligibility for Funding, 1985-1986
(20 of 31 States Responding)

Requirement	Number of States
Resident of that state	20
Teacher preparation only	7
Certificated teacher only	1
Either certificated teacher or in teacher preparation	12

Question 6: How many programs included subject areas other than science and mathematics in their incentive programs? What proportion of the funds were allocated for science and mathematics? (See Table 6.)

In reporting information for the 1984-85 study, five states indicated that their incentive programs included subject areas other than mathematics and science, but they were not asked to indicate the percentage allocated exclusively for mathematics and science. In 1985 respondents were asked to indicate the percentage of funding that was allocated for mathematics, science, or other subject areas. Of the 31 states with incentive programs, 19 states responded to this question. Eleven states indicated that their funding was exclusively for mathematics and/or science teachers. Eighteen states funded subject areas in addition to mathematics and science. These subjects included primarily foreign language and special education teachers. See Appendix A for details given by states.

The total funds spent on incentive programs shown by this study were $28,340,500. When this amount was adjusted to include only the proportion of the funds reported to be spent on mathematics and science teacher incentives, the total funding became $24,800,100. Eight states expended an average of 38 percent of their incentive funds for subject areas other than mathematics and science.

Table 6
Correction of Funding Level to Show
Mathematics and Science Incentive Funding

Total Reported for Incentives	Adjusted Funding for Mathematics and Science	Funding for Other Areas
(n = 24)	(n = 19)	(n = 8)
$28,340,500	$24,800,000	$3,540,400

Question 7: What percentage of states project the continuation of their incentive programs?

Respondents to the survey were asked if their states would continue the incentive programs through 1986-1987 and 1987-1988. Twenty-four of the 31 states with incentive programs answered the survey. Nine-two percent of these indicated that their programs would continue through 1986-1987, but one-third indicated that their programs would be discontinued after that time.

Question 8: How many states have completed evaluation studies on their incentive programs? What were the results of these evaluations?

In 1984-1985, Indiana, North Carolina, and Washington reported completing evaluation studies. A concern expressed in these three studies was whether the number of recipients placed in science or mathematics positions would remain in teaching after the required time for loan forgiveness.

This year's research indicated that no new evaluation studies have been completed. Washington State reported that by mid-June, a study will be released that evaluates the teacher placement of recipients completing teacher preparation. At this time the programs are too new to determine their effectiveness in decreasing the shortage of mathematics and science teachers.

Summary

This study of incentive programs for mathematics and science teachers, 1983-1986, indicates the following:

1. Thirty-one states currently offer incentive programs for mathematics and science teachers.

2. Incentive loan programs are the most common type of incentive offered.

3. Approximately 28 million dollars have been reported spent for incentives for mathematics and science teachers between 1983 and 1986. The actual amount is greater since only 65 percent of those reporting incentive programs reported funding.

4. Approximately 7,000 people have received incentive funds under these programs. Again, the actual amount is greater since only 85 percent of those responding provided this information.

5. The major requirements for eligibility for funds were to be a resident of the state offering the incentive and to be seeking initial certification or upgrading in these subject areas.

6. Eight states reported that about 35 percent of their funds is allocated for incentives in areas other than mathematics and science.

7. Most states will continue these programs in 1986-1987.

8. Three states completed incentive program evaluations last year. No new program evaluations were reported for 1985. Washington State will release an evaluation of the recipients' teacher placements this June.

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APPENDIX A

USE OF INCENTIVE PROGRAMS FOR TEACHERS OF MATHEMATICS AND SCIENCE

State	Type of Program	Percent of Funds for Math/Science	Other Subjects
Alabama	L/S	100%	0%
Alaska	No		
Arizona	No		
Arkansas	L	na	na
California	L	75%	25%
Colorado	No		
Connecticut	L	71%	29%
Deleware	L	100%	0%
District of Columbia	No		
Florida	L/S/T	66%	33%
Georgia	L	32%	68%
Hawaii	na		
Idaho	No		
Illinois	S	na	na
Indiana	L	85%	15%
Iowa	L	na	na
Kansas	No		
Kentucky	L	na	na
Louisiana	L (new)	na	na
Maine	L (new)	18%	82%
Maryland	T	100%	0%
Massachusetts	L	na	na
Michigan	No		
Minnesota	No		
Mississippi	L	na	na
Missouri	L (new)	na	na
Montana	No		
Nebraska	L	100%	0%
Nevada	No		
New Hampshire	No		
New Jersey	T/Stipend (new)	100% (math)	0%
New Mexico	No		
New York	L	na	na
North Carolina	L/S/T	100%	0%
North Dakota	No		

State	Type of Program	Percent of Funds for Math/Science	Other Subjects
Ohio	L (new)	na	na
Oklahoma	S	71%	29%
Oregon	No		
Pennsylvania	S	100%	0%
Rhode Island	No		
South Carolina	L/O	100%	0%
South Dakota	No		
Tennessee	L/S	100%	0%
Texas	L	na	na
Utah	S	na	na
Vermont	L	74%	26%
Virginia	L/S	100%	0%
Washington	L	100%	0%
West Virginia	No		
Wisconsin	No		
Wyoming	No		